


TAXATION OF ECONOMIC RENTS

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Abstract. Economic rents have long been identified as an efficient tax base. In addition, the recent literature documents that rent income is highly concentrated and that rents are quickly increasing. Rent taxation thus seems attractive for reasons of both efficiency and equity. Nevertheless, rent taxation remains a marginal topic in research and policy making. In a systematic review of the neoclassical literature on different rent types, we find that some types of rents reflect inefficiencies and should thus be minimized, while others reward investments and should be supported in line with social welfare. What remains for taxation are land rents, one of the few true scarcity rents. Land rents have significant potential to improve the efficiency of the tax system. We then begin to develop a comprehensive theory of land rent taxation by identifying relevant efficiency and equity effects. The interaction of many of these effects remains unexplored, which might explain policymakers' hesitation in using land taxes to date.

Keywords. Distribution; Land rents; Optimal taxation; Rent taxation

JEL classification: D31; D33; H21; H24

1. Introduction

Progressive income taxation as discussed in Mirrlees (1971) has received a great amount of attention by economists as a response to inequality and as an approach to redistribution. Recently, authors, such as Piketty (2014), have pointed out that a strong concentration of wealth is a major source of inequality, which cannot be addressed by progressive income taxation. Stiglitz (2015) refines this analysis by pointing out

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that a major driver of the concentration in wealth is an acceleration in rent income. He continues to note that models that equate wealth and capital are therefore insufficient to understand increasing inequality.

The high concentration of rents and the disproportionate increase in rents identified in the recent literature suggest that rent taxation could be an ideal tool of redistribution. Rent taxation does not distort the supply of the tax base. For this reason, it is much better suited for redistribution than are capital taxes. Nevertheless, rent taxation is a marginal topic, both in research and policy making.

This paper aims to bridge the gap between the conceptual appeal and the practical irrelevance of rent taxation. As a first step, we outline the scope of a potential theory of optimal rent taxation. We identify seven types of rents. Three types of rents are based on exerting market power and need to be addressed by competition policy. Inframarginal rents have been analyzed theoretically, but empirical analysis is thus far insufficient to guide policy. True scarcity rents and “regulation rents” are suitable for taxation. Regulation rents are those rents that result from regulation motivated by social and environmental concerns.

Empirically, both scarcity rents and regulation rents turn out to be mostly land rents. Land rents are considered to be an efficient source of taxation, but a major obstacle for their introduction is a concern about distributional effects. We propose to make the trade-offs explicit by identifying the most relevant effects for efficiency and equity. Efficiency effects include the nondistortionary effect of land rent taxation on the tax base and incentive effects for the development of land-augmenting technical change. Equity effects include vertical equity, the effect of taxation on households with different levels of wealth, and revenue recycling, reflecting that households may indirectly benefit from increases in land rent taxes, even though they have to pay more for their land.

The empirical literature shows that nonrenewable resources are not scarce in an economic sense. The reason is that progressing technology allows access to ever more resources. The rents obtained in the resource sector have been proven to be rents from market power, not scarcity rents. Rent taxation is thus not an efficient approach for resource rents. Instead, it would be welfare enhancing to apply competition policy and environmental regulation according to the environmental damages caused by the extraction and consumption of the resources. Environmental regulation might include environmental taxes, but these are distinct from rent taxes.

The theoretical appeal of land rent taxation is widely acknowledged and accepted. It is often considered practically infeasible, however. One important reason is the measurement of land rents—they are often bundled with buildings, thereby making the rent not directly observable. This is discussed in more depth in Section 4.2, in which we conclude that identifying land rents is a challenge that has been mastered well enough for practical purposes. A second important reason for the practical infeasibility of land rent taxation is the associated distributional effects. This is discussed in Section 5. We conclude, however, that land rent taxation is very likely to be progressive. As in other areas of optimal taxation, it is important to separate the analysis of welfare optimizing policy from the debate of the political economy of introducing it.

Among economists, the interest in rent taxation has resurged recently (after it had been of great interest to some early economists) due to the empirical observation that rents are quickly increasing and that their ownership is highly concentrated. Piketty (2014) pointed out that there has been a sustained increase in the capital/income ratio, which has been driven largely by housing capital. Knoll *et al.* (2017) break down the housing value into its components and identifies increasing land prices as the major driver of the increase in housing prices. Cowell *et al.* (2018) show that housing wealth is distributed very unequally among households in developed countries. Stiglitz (2015) considers different types of rents and argues that they reflect large amounts of wealth and are also highly concentrated.

While there has been no attempt at developing a comprehensive theory of rent taxation, some papers have considered some of the trade-offs between efficiency and equity effects of land rent taxation. Feldstein (1977) and Petrucci (2006) point out that an uncompensated land tax would have distortionary effects. In response to Feldstein, Fane (1984) clarifies the difference between compensated and uncompensated taxes. Koethenbuegger and Poutvaara (2009) analyze the distributional consequences when land ownership is heterogeneous in an overlapping generation model. Plummer (2010) and Choi and Sjoquist (2015) draw

attention to potential effects of land rent taxation on horizontal equity. We use these and other papers to assess the full range of effects that would determine the impact of land rent taxation on social welfare.

The idea of developing a theory of optimal rent taxation is based on the existing approaches in the literature concerning other tax bases. Mirrlees (1971) provides a breakthrough concerning labor taxation. One of the important innovations in that study was to consider households with different endowments of labor productivity. The model shaped the basic understanding of how taxes can be made progressive to reconcile the objectives of efficiency and equity. The same basic idea is applied to capital taxes by Chamley (1986) and Judd (1985). Their models consider the effect of capital taxes on households with different capital endowments. In this paper, we take the first steps to develop a theory of land rent taxation in which households with different levels of land rent income are considered.

In this paper, we review the understanding of rents in neoclassical welfare economics and propose a classification of the different types of rent and as well as determinants of optimal rent taxation. A review of the literature on economic rents in all economic schools of thought would go beyond the scope of a single paper and reviews on rents in other schools of thought are already available. Outside of neoclassical economics, other schools of thoughts, such as classical economics and Marxist economics, contributed to the understanding of economic rents. Ward and Aalbers (2016) provide an overview on these approaches.

To determine the potential scope of rent taxation, in Section 2 we define a rent and present a systematic classification of rent types. In Section 3, we use empirical evidence to identify the appropriate rent-type classification for some of the most important sources of rents. As land rents are a potentially attractive tax base, we present all major effects of land rent taxation on efficiency in Section 4 and on equity in Section 5. We conclude in Section 6.

2. The Scope of Rent Taxation Theory

An analysis of rent taxation requires a precise definition of the term, but also an understanding of the limits of taxation compared to other policy options to influence rents in the interests of social welfare. In this section, we propose a scope of what rent taxation should address.

2.1 Definition of Rent

The precise meaning of the term economic rent has been subject to debate (Brown, 1941; Mishan, 1959; Currie *et al.*, 1971). Modern public economics settled for economic rent as being “those payments to a factor of production that are in excess of the minimum payment necessary to have it supplied” (Varian, 2006, p. 412), which is a linguistic update of a definition introduced by Wessel (1967). As the authors providing these definitions have primarily land and natural resources in mind, the definition refers to a factor of production. However, there is nothing in the text of Wessel (1967) and Varian (2006) about rents that is specific to production factors. In addition, inframarginal rents as well as the “pure profits” resulting from market power are understood to be economic rents in the literature. We therefore generalize the definition of economic rent to “those payments to a good that are in excess of the minimum payment necessary to have it supplied.”¹ This is a minor adjustment following the spirit of Wessel (1967) and Varian (2006) and reflecting the use of the term in the literature. There is, however, no reason to focus on supply rather than demand, and a further generalization of the definition would refer to “those benefits to an agent that are in excess of the minimum necessary for the agent to accept the transaction.” This additional generalization is important to incorporate monopsony rents in the analysis, in particular.

Piketty (2014) gives two more definitions of a rent, one more general and one narrower than the definition used in public economics, see Figure 1. The one he uses in the book is more general: “income on capital, whether in the form of rent, interest, dividends, profits, royalties, or any other legal category

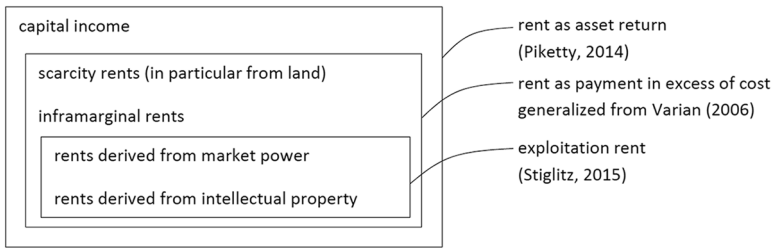


Figure 1. Definitions of Rent.

of revenue, provided that such income is simply remuneration for ownership of the asset, independent of any labor.” Dictionaries’ definition of “rentier” refers to this definition of the word rent.

According to Piketty (2014), the meaning of the word rent shifted over time and is now often used “to denote an imperfection in the market (as in ‘monopoly rent’), or, more generally, to refer to any undue or unjustified income.” This explains why “the words ‘rent’ and ‘rentier’ took on highly pejorative connotations in the twentieth century.” This meaning of rent is termed “exploitation rent” by Stiglitz (2015).

Piketty (2014) uses a broad definition of rent because his book is concerned with wealth inequality. In this paper, we are concerned with a specific type of assets: those that yield rents in the sense of public economics. In the remainder of this paper, we therefore use the definition of rent given by Wessel (1967) and Varian (2006), and its generalization to demand.

2.2 Types of Rents

Among the rents that conform to our definition, different types can be distinguished. Before introducing a taxonomy of rents, it should be clarified that rents can appear in at least three different contexts. Consider the partial equilibrium demand–supply framework. In this framework, two types of rents can be identified, as illustrated in Figure 2.

In this figure, a rent appears when the quantity traded is below the equilibrium. This rent will be captured by the supply side in case of monopoly for instance, by the demand side in case of monopsony and by the government in case the wedge between supply and demand is generated by a tax. Whether this situation generates a deadweight loss (DWL in the figure) depends on the presence of social costs and benefits, in addition to private costs and benefits that determine the demand and supply curves.

The surplus obtained by either side of the trade is another form of rent, since the curves are not perfectly elastic. The surplus is usually considered to be an acceptable form of benefit. However, the difference between the surplus and rent is sometimes thin, as illustrated below. Moreover, consider an industry in which the firms manage to externalize some of their costs. This increases their surplus (as well as consumer surplus), even under perfect competition, but it is not a socially optimal form of increasing it. Therefore, one can always suspect some of the producer and consumer surplus to come from externalized costs (such as health problems for workers), a form of rent-seeking behavior.

Another setting in which similar rents can occur is bilateral trade bargaining. In this case, one can identify rents with the benefit that either side obtains above and beyond the disagreement point. In standard situations, this benefit is very much like surplus. However, rent seeking occurs when a party tries to enhance its bargaining power, and one can also identify a form of rent simply when one party has a greater bargaining power due to certain positional advantages (e.g., wealth that decreases risk aversion).

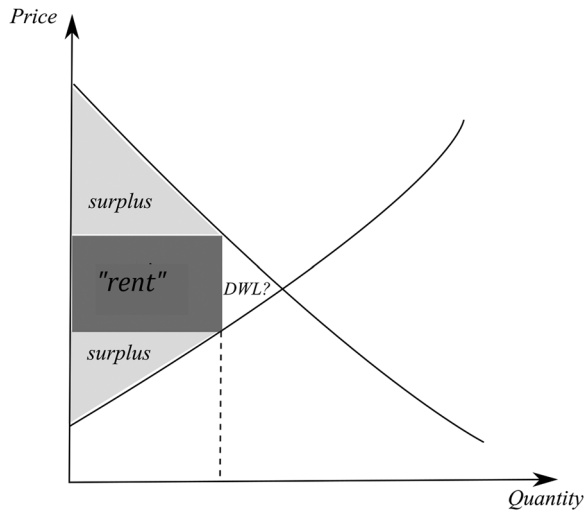


Figure 2. Rents in the Partial Equilibrium Setting.

A third setting in which a rent is observed is when information is asymmetric among agents and some agents are able to obtain an advantage by keeping their information private. This type of informational rent is pervasive in adverse selection when high-type (e.g., high skilled or high risk) agents are able to derive a benefit from their ability to mimic low-type agents' observable behavior.

In this paper, we focus on the partial equilibrium setting and devote the remainder of this section to a taxonomy of rents in this setting. In order to make the classification practically relevant, we base the clustering on the different types of government intervention, which are required to address them. We obtain seven categories: regulation rents, political rents, investment rents, natural monopolies, market power, inframarginal rents, and scarcity rents. Following the description of the types of rents, we discuss the optimal policy responses in Section 2.3 and discuss examples in Section 3.

2.2.1 Regulation Rents

For goods that cause an externality, there is a difference between the private marginal cost and the social marginal cost of production. In order to internalize the externality, the government can use regulation to shift the market equilibrium from the intersection of the private marginal cost with demand toward the intersection of the private plus social marginal cost with demand. If the dashed line in Figure 2 is interpreted as a government imposed maximum of production, the dark gray area represents the regulation rent. The produced quantity and the price correspond to the social optimum. When the regulation is implemented in the form of taxes or sale of quotas, the government automatically captures the rent and there is no DWL.

2.2.2 Political Rents

Political rents are similar to regulation rents in the mechanism, but the objective of the policy is different. Political rents are those that are tolerated or even actively created with the intention of granting a private source of income. The creation of political rents was described by Stigler (1971) and has been broadly documented (Benmelech and Moskowitz, 2010; Mian *et al.*, 2010; Duchin and Sosyura, 2012). Political

rent creation often works through excluding competitors (Djankov *et al.*, 2002), so that these rents could also be termed exclusion rents. As politicians create these rents intentionally, it may be naive to attempt to reduce these rents. Djankov *et al.* (2002), however, show that better institutions, and democracy in particular, are more successful in reducing political rent creation.

Political rents can be more or less subtle. An aggressive form of political rent is described in Parente and Prescott (1999), in which policy makers actively maintain monopolies with the intention of enriching themselves. An intermediate form for political rent occurs when firms develop ways to exclude competitors. While the firms take the initiative and in many cases do not share the benefits actively with policy makers, the government still fails to regulate effectively and thus tolerates the creation of rents. Examples for this latter type of political rent are rents in the financial sector, see Section 3.4.

Whenever economic activities are restricted, rents are generated. Politicians can channel these rents to support groups, but the rents also provide an incentive for individuals to engage in rent seeking (Krueger, 1974). This effect may be particularly pervasive in the early stage of democratization when more openness increases the opportunity to gain access to rents (Mohtadi and Roe, 2003). In a situation with strong political polarization, governments have an incentive to capture the rents of government spending for their own constituencies, by spending all available revenue. The attempt to spend all available revenue can cause government spending to become procyclical and thus lose the opportunity of using government spending for countercyclical consumption smoothing (Ilzetzki, 2011).

Apart from the obvious distributional implications, rent-seeking activities also reduce aggregate efficiency. Murphy *et al.* (1991) show that economies grow more slowly when they provide incentives for their most talented workers to engage in rent seeking instead of innovation. When there are competing social groups and aid is not linked to binding policy commitments, then foreign aid causes so much rent seeking that the provision of public goods does not increase through the aid (Svensson, 2000). Similarly, newly discovered natural resources shift entrepreneurial activity from productive firms to rent seeking so that aggregate welfare may fall (Torvik, 2002).

When the dashed line in Figure 2 is interpreted as a deliberate reduction of supply by a collusion between government and producers, the dark gray area corresponds to political rents. The necessity of government intervention, or a reform of governance to prevent this type of collusion, derives from the creation of a DWL.

2.2.3 Investment Rents

Investment rents are created when private investments allow firms to obtain market power. Van Reenen (1996), Bresnahan *et al.* (1997), and Petrin (2002) show directly how innovation allows the innovator to obtain market power and the resulting rents. The literature on endogenous growth (Grossman and Helpman, 1991; Aghion and Howitt, 1992) points out that rents are crucial as an incentive for innovators. The reason is that creating an innovation requires investment, but the innovation can be used at zero cost. In an unregulated market, this would cause a market failure and no innovations would be created. Regulation can take the form of patents, given to innovators so that they can limit supply, create rents, and finance their innovations with these rents. Hayek (1948) and Weizsäcker (1980) argue that establishing a brand is an investment with similar properties as an investment into innovation.

Investment rents are closely related to political rents and are also represented by the dark gray area in Figure 2. The difference between the two is that investment rents compensate the investor for the innovation. They thus serve as a means for correcting a market failure that would otherwise occur for an investment with fixed costs but no marginal costs of production.

As the endogenous growth literature emphasizes, investments into research and development are based on a cost–benefit calculation of firms. On the cost side are investments into capital and labor as well as a risk premium, since there is a significant amount of uncertainty involved in research. On the benefit side are the rents, which can be obtained under the protection of the patent for as long as the patent lasts.

If the patent duration is too short, there will be no investment into expensive research projects. If it is too long, firms will earn a rent exceeding the amount necessary to motivate the investment. In this case, the exploitation of the market power will last inefficiently long. The government should thus set patent duration to optimize this trade-off.

As Antonelli and Gehringer (2017) point out, Schumpeterian creative destruction can have important benefits for society: New innovations destroy the business of wealthy incumbents and thus reduce inequality. A healthy rate of technological progress thus ensures not only economic efficiency, but also contributes to equity.

2.2.4 *Natural Monopolies*

Natural monopolies are defined by Baumol (1977) as “an industry in which multifirm production is more costly than production by a monopoly.” Natural monopolies arise in industries with barriers to market entry like high fixed costs. A natural monopoly can create rents through the monopolist’s market power. However, part of the rent may serve to cover the fixed costs, as in the case of investment rents. Here again, the rent is excessive only if it more than compensates for the fixed costs.

2.2.5 *Market Power*

Market concentration can occur spontaneously through economic forces, such as network effects and aggressive anticompetitive behavior by some firms. An example for this are the large internet-based companies. Some of these firms may not engage in anticompetitive activities and may simply try to grow as much as possible. As their market power increases, their rent increases along with their markup (Barkai, 2016; De Loecker and Eeckhout, 2017, 2018).

The distinction between these rents and political rents is subtle, considering that it would be the role of the government to regulate these markets in the interest of social welfare. Possible regulation ranges from prohibiting the acquisition of competitors to an enforced break-up of the company. A government that does not make use of regulation is effectively tolerating the creation and exploitation of rents, becoming an accomplice to the persistence of the rent.

2.2.6 *Inframarginal Rents*

Inframarginal rents occur when the production technology is convex, see the lower light gray area in Figure 2. In this case, the market price is higher than the production cost of inframarginal units, so that the revenue on them exceeds costs, thus providing a rent. Hellwig and Irmen (2001) show that inframarginal rents can have a similar role as the rents created through the market power of an innovator: They can finance innovation. Inframarginal rents are difficult to measure precisely, because they require information on the cost of production. Because of their potential role of financing innovation, they might also have a socially beneficial function. In addition, “little is known about the source and significance of these rents” (Boldrin and Levine, 2008).

It may appear odd that “little is known” about this type of rents, even though every student of economics is familiar with graphs of increasing supply curves in economics textbooks. The apparent contradiction is resolved by Varian (2006) when he distinguishes between the supply curves of individual firms, which may be increasing, and industry supply curves, which determine the market equilibrium: “In an industry with free entry and exit, the long-run average cost curve should be essentially flat at a price equal to the minimum average cost” (Varian, 2006, p. 408). At such a price, the marginal cost is also equal to the price and there is no scarcity rent in the form of the dark gray area of Figure 2. Moreover, the inframarginal rent (producer surplus) exactly covers the fixed cost. The free entry condition automatically apportions the inframarginal rent to the fixed costs that need to be covered.

2.2.7 Scarcity Rents from Bounded Supply

For some goods, the cost of production is an increasing function of the total amount produced. As a result, the supply curve is upward sloping and this slope can become extremely steep. As long as the supply curve is continuous, however, there will be an equilibrium price at which the cost of production is equal to demand. This kind of good yields inframarginal rents, but the good is not really scarce—more could be produced if demand were higher.

For some goods, the supply curve is below demand and then breaks off, meaning that no additional production is possible. In these cases, demand at the maximum amount of production determines the price. Since this price is higher than the marginal cost of production, a scarcity rent results, see Figure 3. The intertemporal management of a resource available in finite supply is analyzed in “Hotelling models” named after Hotelling (1931).

Figure 3 illustrates how similar a scarcity rent is to producer surplus. In the figure, the demand curve intersects the marginal cost curve (in its vertical part) and, referring to Figure 2, the gray area is technically a surplus. But, imagine that for some reason (regulation or political intervention), production stopped just before the maximum amount was reached. In this case, a rent is clearly created. By making the production come closer and closer to the maximum, this rent tends toward the surplus that we see in Figure 3.

2.2.8 Classification of Rents

The distinction of rents described above highlights that rents can be classified in different ways. Some rents have similarities that could justify grouping them together:

- Political rents, investment rents, and natural monopolies all associate with market power.
- Scarcity rents, due to bounded supply, could be seen as a variety of inframarginal rents, the difference between the two simply being the discontinuity in the supply function in the case of scarcity rents.
- Regulation rents are related to scarcity rents due to bounded supply since the regulator effectively acts (partially or fully) like a monopolistic owner of a scarce resource by reducing supply to more sustainable levels.
- Political rents and regulation rents both result from political interventions, which cause a reduction in supply. They are distinguished by whether or not the intervention increases social welfare.

If a different criterion of classification were used, naturally, different categories would result.

Apart from the superordinate term “economic rent,” only the term “monopoly rent” is defined in the literature. The need for further distinction, however, becomes clear in the literature on rents from resources

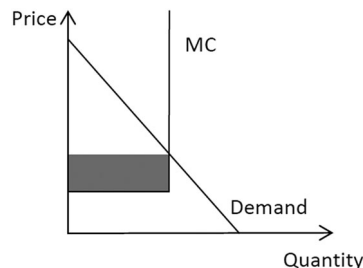


Figure 3. Scarcity Rents (Gray Area) Result When There is a Definite Limit to the Supply of a Good and When Demand at the Maximum Possible Amount of Production Exceeds the Marginal Cost for Producing the Good.

like oil. The literature shows that rents from the production of oil exist, but also shows that they originate from the market power of the producers and not from a genuine scarcity rent as described here.

2.3 *Optimal Policy*

Based on this classification, we can identify which type of rent should be addressed with which kind of policy. We assume that the government maximizes a Bergson–Samuelson welfare function and that reductions in aggregate efficiency and increasing inequality are reflected in lower welfare.

Regulation rents result from deliberate welfare-increasing government intervention. They do not indicate an inefficiency and do constitute an efficient tax base. In many cases, however, the regulation takes the form of market instruments like taxes or certificates. This leaves no room for additional taxation. When the regulation takes the form of excluding a part of the resource from economic use, as in the case of forest protection, the resulting rent can be subjected to taxation.

Political rents can be seen as the result of an inherent principal–agent problem between the population (the principal) and the government (the agent), as the government's interests are not perfectly aligned with social welfare. This makes the complete elimination of political rents very difficult. As political institutions mature, however, there are options to minimize political rents. One option is competition policy (Motta, 2004; Wilks, 2010), which is also central for other types of rents. In addition, political rents can be reduced by improving governance. Hill and Hupe (2014) provide an overview of how this can be implemented.

Investment rents are justified by the socially beneficial investments financed with these rents. This type of rents is thus also subject to competition policy, but the focus here is to identify the right level of rents, not to eliminate the rents altogether. An important part of competition policy with respect to investment rents is the regulation that concerns patents and trademark law. The optimal design of patent systems is analyzed in Gilbert and Shapiro (1990), Encaoua *et al.* (2006), and Judd *et al.* (2012) for example. In addition, Mazzucato (2013, 2018) emphasizes that the government has an important direct role in developing innovations. When these innovations are made freely available, the respective rent is appropriated by society at large.

For natural monopolies, it is insufficient to remove entry barriers and ensure fair competition. Market power cannot be avoided in this way. Instead, strong government action is required (Joskow, 2007; Joskow and Wolfram, 2012; Lim and Yurukoglu, 2017), for example, in the form of publicly run providers² with a regulated pricing strategy.

Market power emerging from spontaneous economic forces is the object of competition policy. While competition policy is usually understood as a form of regulation, it actually often involves fines that can be interpreted as a form of taxation of illegitimate profit. In the dynamic evolution of the level of market concentration, taxes on profits made by dominating firms can operate as a deterrent and are efficiency enhancing. Modulating corporate tax as a function of market concentration does not necessarily mean that the optimal average level of corporate tax should be higher than current levels. However, high levels of recidivism, for instance in Europe, indicate that the current level of fines is insufficient, in spite of a steep increase in the last decades (Geradin and Sadrak, 2017).

Taxing rents that result from market power can complement more direct approaches to reducing market power. When rents from market power occur, they should be separated from other components of profits for the purpose of taxation (Griffith and Miller, 2014). Once these rents are identified, it is optimal to tax them at 100% since they are nondistortionary (Judd, 2002; Coto-Martínez *et al.*, 2007).

Inframarginal rents are insufficiently understood thus far (Boldrin and Levine, 2008). Before they can be addressed politically, they will thus have to be analyzed in more detail. As indicated above, in the case of free entry and exit, in the long run these rents adjust to cover fixed costs.

Scarcity rents, due to bounded production, cannot be abolished with competition policy or with any other government intervention. By definition, the production of the good creating the rents cannot be expanded. Just like regulation rents, these rents should thus be subjected to optimal taxation. Optimal taxation does not necessarily mean “maximal taxation,” since taxation can cause negative effects, in particular for the distribution of income. In Sections 4 and 5, we explore which aspects have to be considered in optimization.

3. Major Examples of Rent Generation

Different types of assets, including resources, certain types of investments, and government-granted privileges, yield rents. It is not always evident which type of rent they generate. Some resources, for example, are scarce, but the high rents result from regulation that protects these resources from being exploited unsustainably. Other resources are not scarce at all, yet they nevertheless generate rents, because there are only a few producers, who can exert market power and thus generate market power rents or preserve them as political rents. In this section, we review the empirical evidence to classify rent-yielding assets according to the categories defined in Section 2.2.

3.1 *Nonrenewable Resources*

The Hotelling (1931) model of exhaustible resources has strongly influenced the economic analysis of nonrenewable resources. This model is based on the assumption that resources are very limited and thus earn a scarcity rent. Empirical research, however, has revealed that the amount of resources available is sufficient to maintain current economic consumption for centuries (Krautkraemer, 1998). These resources are available more or less easily. As technology progresses more and more, resources can be acquired (Hart, 2016). As a consequence, tests of the Hotelling model are typically rejected (Halvorsen and Smith, 1991; Lin and Wagner, 2007; Atewamba and Nkuiya, 2017).

Ellis and Halvorsen (2002) find that the difference between the price and the marginal cost of resources is mostly due to market power rather than scarcity rents. Livernois (2009) concludes that “the empirical evidence seems to suggest that scarcity rent may actually have been the least important determinant of price so far.” Hart and Spiro (2011) find “that scarcity rents seem to have been marginal or non-existent historically” and “that they almost certainly do not dominate resource prices today.” Even profits in the oil sector do not seem to be originating from scarcity rents. Hamilton (2009) conclude that “scarcity rent made a negligible contribution to the price of oil” and Cairns and Calfucura (2012) find the “scarcity rent to Saudi oil production to be negligible.” Instead, the profitability of oil production seems to originate in market power (Hansen and Lindholt, 2008; Huppmann and Holz, 2012; Nakov and Nuno, 2013).

Garnaut (2010) claims that there are significant resource rents to be taxed in Australia. However, these rents originate from the allocation of mining leases by the Australian governments and from rents obtained by prior exploration activity (called “quasi-rents”). According to our classification, these are regulation and investment rents, respectively. The regulation rent would not arise if the government would demand market prices for the mining leases. The investment rents should not be taxed, as also highlighted by Garnaut (2010).

According to the classification presented in Section 2.2, rents from nonrenewable resources are thus market power rents and political rents. Governments allow their domestic resource producers to exercise market power that keeps prices high even though the resources are not constrained “in the sense of the economics of exhaustible resources” (Cairns and Calfucura, 2012). The case of nonrenewable resources discussed here shows that a single national government cannot ensure fair competition, since there is a global market. It is important to note that the supply of nonrenewable resources could be much higher if regulation encouraged free competition. This stands in contrast to a situation in which resources are

naturally scarce. In addition to sound competition policy, a welfare maximizing regulation of resource markets would, of course, require environmental regulation.

We thus have to make the important distinction between the taxation of a resource and the taxation of a rent. Consider a government of a closed economy and assume that it intends to regulate resource extraction to maximize social welfare. As resource extraction and/or consumption generates environmental externalities, the government needs to implement Pigouvian taxation. The Pigouvian tax generates a regulation rent that is automatically absorbed by the government.

If a given resource is not harmful to the environment, then supplying the resource at a competitive price would optimize social welfare. A resource that does not cause environmental externalities is just a commodity like many others. The literature on commodity taxation (e.g., Atkinson and Stiglitz (1976) and Kaplow (2006)) indicates that the reasons to tax commodities involve issues of complementarity with leisure and correlation of consumption patterns with inequalities. Otherwise, income taxation is a more suitable method of redistributive taxation.

Franks *et al.* (2017) give an apparent counterexample to the claim that resource rents should not be taxed. In the paper, the government of a resource-importing economy taxes CO₂ emissions in order to capture the rent of the resource exporter. This indirect taxation of a resource rent increases welfare. The important point, however, is that the two governments do not act cooperatively and thus do not achieve globally optimal policy. It would be efficient from a global perspective to ensure competitive production³ and then, if the resource is environmentally harmful, to apply Pigouvian taxation.

3.2 *Land*

All over the world land is protected from economic use for conservation purposes. The total area of land under protection was 12.9% in 2009 (Jenkins and Joppa, 2009) and 14.6% in 2015 (Butchart *et al.*, 2015), continuing a long run upward trend (Watson *et al.*, 2014). Much of this land would be valuable for agriculture—the conservation policy thereby withdraws some land from the market that would otherwise be used. As a consequence, the remaining land has a higher market price than it would have without the regulation. According to Section 2.2, land thus generates a regulation rent. This regulation rent could be subjected to taxation, since the regulation typically does not take the form of a land tax or permits for land use.

The steadily rising prices for urban land, as documented by Knoll *et al.* (2017), cannot be explained with regulation for conservation purposes alone. Agricultural land is more valuable near cities (Guiling *et al.*, 2009) and urban land is more valuable in city centers (Capozza and Helsley, 1989). Land in good locations is thus scarce and earns a scarcity rent.

Lichtenberg (1989), Gurgel *et al.* (2011), and Bustos *et al.* (2016) describe technical change that has a land-augmenting effect: it increases land rent because it increases the productivity of the land. The part of the land rent gained with this kind of investment in technology is thus an investment rent. Similarly, investments in infrastructure can generate an investment rent in surrounding land.

Caselli and Feyrer (2007), Table 1, give an empirical estimate of the importance of land rents. According to these data, cropland, pasture, and urban land had shares of, respectively, 11.4%, 4.5%, and 13.1% in total wealth globally. Kalkuhl *et al.* (2018), Table 10 in the Online Appendix, present a calculation of land rent, and thus their empirical importance, in individual countries.

3.3 *Renewable Resources*

Renewable resources are often linked to scarcity. Fish stocks and forest resources, for example, are reduced by harvest and have a natural regrowth. When the harvest exceeds the pace of regrowth, the stock can reach zero without the prospect of recovery (Stavins, 2011). For this reason, in most cases,

these resources are regulated: harvest is limited by regulation. This regulation gives rise to rents that are reflected in the high value of fishing quotas (Homans and Wilen, 2005; Andersen *et al.*, 2010; Arnason, 2012). Fish and forest resources are thus examples of regulation rents. In many cases, the government directly skims these rents through the sale of quotas, which is equivalent to taxation. For timber with extremely slow regrowth rates, regulation rents are very similar to the scarcity rent of a monopolist (in this case, the government) selling off a nonrenewable resource (Livernois *et al.*, 2006).

A very important type of renewable resource is the “disposal space in the atmosphere” (Edenhofer *et al.*, 2015a; Jakob and Hilaire, 2015). Without regulation, this disposal space is not scarce. Once it is regulated, however, emission rights for CO₂ can be very valuable. Governments can appropriate these rents by selling emission certificates or taxing emissions.

Hydropower seems to be an interesting special case. As the sources for hydropower are limited, it generates “significant” rents (Banfi *et al.*, 2005; Banfi and Filippini, 2010). As the water flow does not require protection through regulation, this is a genuine scarcity rent. The government of Switzerland captures these rents through fees.

3.4 *The Financial Sector*

There is a strong intuition that some indicators of the financial sector can only be explained with the exploitation of economic rents. Private-sector debt more than tripled as a share of national income between 1950 and 2006, from 50% to 170% (Turner, 2017). Salaries are perceived to be higher than in comparable positions in other sectors with “CEOs who make 10 times as much as they would if they applied their talents to manufacturing firms” (Epstein, 2018). Some charges, for example, interest rates of credit cards, have been described as “extortionate” (Hudson and Bezemer, 2012). Arcand *et al.* (2015) provide empirical evidence that the relationship between financial depth and output growth is nonmonotonic. When credit to private sector exceeds 100% of GDP, it has a negative effect. If the financial sector manages to grow beyond that, incentives cannot be aligned with social welfare.

However, in the words of Epstein (2018), “The sources of these rents... are not completely understood.” Referring to their observation on the effect of financial deepening, Arcand *et al.* (2015) observe, “the causality issue has not been fully resolved.” Nevertheless, there are some indications where these rents are coming from. Banks derive rents from implicit government guarantees to bail them out in a crisis (Admati and Hellwig, 2014). Actors in the financial sector can also externalize some of their costs (Di Tella, 2019) and manipulate the market (Putniņš, 2012). These cases fall in the category of political rents as they result from insufficient regulation.

Further, there are rents from market power. The over-the-counter derivatives market is strongly concentrated (Epstein, 2018) and the credit card market is dominated by just two main companies, for example. Finally, Ryan-Collins *et al.* (2017) and Turner (2017) describe a feedback cycle between land and private credit. Land value is used as a collateral for private credit and the supply of credit is increasing land value. This indicates that the financial sector takes a share of land rents.

3.5 *Electricity Capacity*

Since the production of electricity from some renewable resources is variable, electricity prices can reach high levels in times of low supply. Electricity providers, like gas-fired power plants, have marginal costs above those of renewable resources, so that renewables are the cheapest supplier when there is a large supply. When supply is low, however, gas-fired power plants can earn prices well above their marginal cost by exercising market power. At these times, they thus earn a rent that they use to finance the cost of maintaining capacity at the times of low demand. See Finon and Pignon (2008) and the other papers in that issue of *Utilities Policy*.

The rents earned by electricity providers in times of low renewable supply are investment rents according to the classification in Section 2.2. Maintaining capacity, just like financing innovations, requires investments, but there is no market for the obtained product (security of supply and innovations, respectively). Instead, the investment is refinanced by selling a derived product (electricity or the product incorporating the innovation) at a high price achieved with the use of market power.

3.6 Rents on Beauty and Height

A number of studies report that taller or more beautiful people earn higher wages. This is not among the most pressing of distributional questions, but it does raise the question of what type of rent the “beauty premium” and the “height premium” constitute, if any. The evidence for the height premium indicates that it does not reflect a rent at all. Case and Paxson (2008) find that height is correlated with cognitive ability. Vogl (2014) argues that the correlation results from “childhood inputs” and shows that taller workers sort into occupations with greater intelligence requirements.

The beauty premium has been described as “pure employer discrimination” (Hamermesh and Biddle, 1994). It occurs with high school graduates (Fletcher, 2009) and can be based on no more than a photo (Bóo *et al.*, 2013). The willingness of employers to pay more for attractive workers can be explained to some extent by the success of beautiful people with clients (Biddle and Hamermesh, 1998; Pfann *et al.*, 2000), but it occurs across all sectors (Hamermesh and Biddle, 1994). This evidence suggests that part of the beauty premium is a scarcity rent, because customers and employers are willing to pay for beauty, a “good,” which is in limited supply and cannot be produced. In addition, Mobius and Rosenblat (2006) find that beautiful workers obtain a payment premium, because they have particular skills that enable them to manipulate employers in negotiations.

4. Efficiency Effects of Land Rent Taxation

As we have seen, many forms of rent are political rents, investment rents, or rents from natural monopolies. The efficient policy response to these rents is governance reform and regulation to reduce them to zero or, in the case of investment rents, to their socially productive level. Inframarginal rents need to be better understood before they can be addressed by policy. This leaves regulation and scarcity rents (and possibly market power) for taxation. In the following, we will focus on land rent taxation as the most clear-cut example.

Rent taxation is attractive compared to other forms of taxation because it does not cause tax avoidance in the form of supplying less of the tax base. In practice, however, a number of possible effects need to be considered when rent taxes are introduced. These effects can be grouped into efficiency effects (discussed in this section) and equity effects (discussed in Section 5). We begin with two clarifications. First, land generates different amounts of rents, so that there is a difference between taxing units of land and taxing the land rent, see Section 4.1. Second, there is no direct way of measuring the land rent, it therefore takes some effort to identify, see Section 4.2. With those clarifications made, four effects of how land rent taxes affect aggregate efficiency can be discussed.

In Section 5, we go beyond the aggregate view and take the heterogeneity of households into consideration. Households own different amounts of land rents. Introducing a land rent tax would therefore cause a distributional effect: Households would have to pay different amounts of land taxes. This alone would have important implications for political implementation. A comprehensive assessment of distributional effects, however, must consider the effect of the additional revenue by the government. Households could benefit in the form of tax reductions on other taxes or from improved public good provision. The distributional effect will thus depend on the net effect of rent taxes paid and benefits received.

4.1 Types of Taxes

In Section 3.1, we distinguished between the taxation of a resource and the taxation of a rent. For land, this translates into unit taxes and value taxes. This difference in the tax base has implications for both the surplus and the supply of land. The leftmost panel of Figure 4 shows the situation without taxes. The total amount of land (\bar{L}) is sorted from highest to lowest value (V). The shaded area is the rent received by the landowner. The central panel shows the case of a roughly 50% value tax. Half of the rent remains with the landowner and the other half is taken by the government through the taxes (dotted area). The right panel illustrates the case of a unit tax. Only the land with a high value (up to L_1) remains in use.

Both types of taxes can be meaningful—they correspond to different policy objectives. Value taxes are applied primarily as a nondistortionary form of taxation, see the first effect described in Section 4.3. Unit taxes serve as a source of government revenue, but also allow for a sparing effect, see the second effect described in Section 4.3. If both a nondistortionary form of taxation and a sparing effect are desired, a combination of these types of taxation is meaningful. Some countries apply unit taxes differentiated by land type without the intention of achieving land sparing. In these cases, the unit tax is an approximate form of value tax as the type of land is the only information the government has available on its value.

4.2 Identifying the Rent

In Section 2.3, we identify which kind of policy is optimal to address the different types of rents. It is, however, not straightforward to separate rents from returns to capital, nor to distinguish the different types of rents. The performance of the policy depends on precisely identifying these rents.

For urban land, distinguishing the land rent from returns to capital is indeed a challenge, but is actually done. The sum of the value of land and buildings is estimated through real estate appraisal. There are established processes for this, see, for example, the International Valuation Standards Council. In order to determine the land rent, the value of the real estate must be broken down into the land value and the value of the buildings. This distinction is important since the buildings require investment. In spite of the complexity of disentangling the value of the land from the value of the buildings, it is possible to determine land value with satisfactory accuracy, see Bell *et al.* (2009), Henry *et al.* (2009), and Mirrlees *et al.* (2011), chapter 16.

For agricultural land, a similar distinction is required. Abdulai *et al.* (2011) show that soil quality requires investments, for example, into planting trees, mulching, and application of organic manure and mineral fertilizers. These investments are tied to the land, but economically they are a form of capital and are not part of the land.

In addition to distinguishing returns to capital from rents, it is necessary to distinguish investment rents from scarcity and regulation rents. In Section 3.2, we showed that part of the land rent can be due to

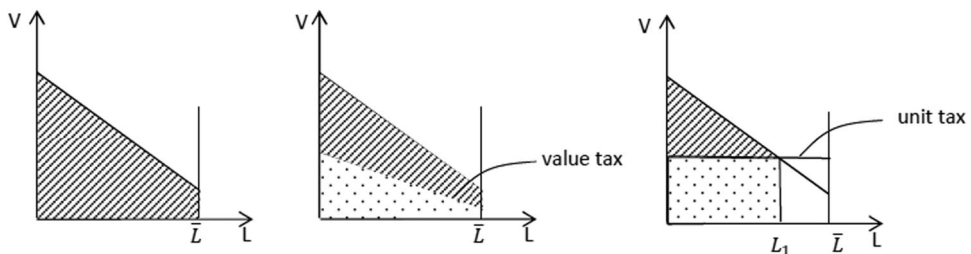


Figure 4. Value (Middle Panel) and Unit Taxes (Rightmost Panel). The Amount of Land is Represented on the X-Axis by L , Whereas the Value is Represented on the Y-Axis by V .

investments into land-augmenting technical change, which is an investment. Taxing this investment rent would discourage investment.

Identifying the scarcity and regulation rent of land thus requires a three- step process: first, real estate appraisal; second, distinguishing the value of capital from the value of the land; and third, distinguishing investment rents from scarcity and regulation rents. While a perfectly accurate distinction will not be possible, the first two steps seem to work well in practice. Cited academic literature also gives indications of achieving the third step.

4.3 *Efficiency Effects*

As mentioned above, the main intention of introducing value taxes is to make the tax system efficient. Unit taxes can be used to achieve a sparing effect for environmental reasons. Rent taxation, however, can have additional effects, which would probably be considered side effects. These side effects can also have important implications, so these should be considered in the design of the tax.

4.3.1 *Distortion of the Tax Base*

Most governments are mainly financed by distortionary taxes, for example, on labor and capital. Taxes on labor and capital constitute a disincentive to provide these production factors, thus reducing the tax base and causing a DWL. Consumption taxes, like value-added taxes, have a similar effect since they reduce the amount of goods that can be purchased with a given wage and thereby reduce the profitability of providing labor (Atkinson and Stiglitz, 1976). In contrast, when nonreproducible production factors are taxed below 100% of their value, they are provided inelastically. In this case, the tax base remains unaffected and no DWL results. For this reason, land value taxes are a more efficient form of taxation than distortionary taxes, such as labor and capital taxes, as first described by Adam Smith and Henry George, see Mattauch (2015) for a review of the early economists' insights. Oates and Schwab (2009) provide a brief theoretical summary of this argument.

Rent taxation is not neutral in the sense of not affecting economic decisions as pointed out by Feldstein (1977). An important effect is, for example, that rent taxes reduce the income of the households owning them and thus cause a wealth effect. If preferences are not homothetic, this can also cause a change in the spending composition of households. However, though it has some real effects, it is not distortionary. As clarified by Fane (1984), a compensated rent tax would be perfectly neutral, but would require the government to use all the revenue from the rent taxation to compensate the taxed households. As it is the intention of a rent tax to generate government revenue, uncompensated rent taxation must be used and will result in the described wealth effect. Rent taxation is therefore still the most efficient form of taxation as all other taxes cause wealth effects plus distortions due to the shrinking tax base.

4.3.2 *Sparing Effect*

The economic use of land can have harmful effects on the environment. If these harmful effects are larger than the economic benefits of use, social welfare would be improved by discouraging their use. This can be achieved by taxing the rent income above 100% of its economic value, for example, with a unit tax as illustrated in the right panel of Figure 4. This kind of taxation would be distortionary, but the distortion is intended. We call this a sparing effect following the concept of "land sparing" as in Phalan *et al.* (2011).

Land that is not used for economic purposes can be used for conservation, in particular to provide ecosystem services and preserve biodiversity. When unit taxes on land increase the cost of developing land, more economically marginal land will be left for conservation and out of economic use (Kalkuhl and Edenhofer, 2016). Similarly, a tax on urban land can limit urban sprawl, thus increasing the density of cities and maintaining land for agriculture (Banzhaf and Lavery, 2010).

4.3.3 *Portfolio Effect*

In addition to being an efficient source of taxation, rent taxation has the potential to increase capital investments through the “portfolio effect” (Feldstein, 1977). A portfolio effect occurs in models with imperfect altruism between generations. Households save for retirement by accumulating assets. When a nonreproducible production factor (land in particular) is taxed, it becomes less useful as a store of value. As a consequence, households shift their savings portfolio toward reproducible production factors, capital in particular. When capital is underaccumulated, the portfolio effect provides a second type of efficiency gain from rent taxation (Edenhofer *et al.*, 2015b).

4.3.4 *Incentive Effects*

In Section 3.2, we have seen that land also receives investment rents from land-augmenting technological change. A land rent tax might thus act as a disincentive on investing in technology. However, the land rent tax could be designed in a way that allows technology investors to retain the rent increase resulting from technology improvements. This is analogous to patents for other kinds of technology.

The value of urban land is due to agglomeration effects. The land value for one piece of land reflects the positive externalities created by capital investments on neighboring pieces of land. Investments can be made by the government sector, for example, in the form of public transport infrastructure or public parks. They can also be made by private investors in the form of private buildings, which increase the location value. The appropriation of land rent increases from public investments through taxes is called value capture (Medda, 2012). According to the Henry George Theorem (Arnott and Stiglitz, 1979), public infrastructure can be financed entirely through value capture. To ensure full efficiency, this principle of compensating the investor who generates a positive externality would have to be extended to private investors. This means that private investors, which generate a positive externality, should be compensated for this externality.

4.3.5 *Property Rights*

The value of land is given by the discounted sum of expected future rents. The permanent introduction of a land rent tax, which taxes fraction x of the rent, thus reduces the land value by the same fraction, x (Oates and Schwab, 2009). The introduction of a land rent tax is thus equivalent to a (partial) expropriation of land owners. Compensating the land owners for this loss is possible, but as discussed above, is not meaningful in practice. Given this comparison to “expropriation,” it is important to clarify how this relates to the role of property rights identified by new institutional economics.

As North (1991, 1994) points out, the development of advanced institutions is strongly connected to ensuring property rights. As countries developed historically, they managed increasingly to assure property rights to individuals, which encouraged them to invest and thus create the basis for sustained growth. Acemoglu and Robinson (2012) point out the importance of intellectual property rights in particular, which provide the incentive for innovations. Property rights on land are also crucial, as they assure investors that they will receive the return on any investments they plan to make.

It is thus useful to follow a differentiation of property rights into control rights and the right to the residual. Control rights refer to the right of deciding how to use a resource, while the right to the residual refers to the right of retaining the residual income after deducting labor and capital expenses. A tax on land rents would be equivalent to expropriating the right to the residual, which would be (partially) claimed by the government. A land owner could still, however, control the use of the land. If the owner invests, she/he could retain the capital return to the investment. The expropriation of the right to the residual by the government would thus be compatible with the important role of property rights for investments.

4.3.6 *Effects on the Financial Sector*

Ryan-Collins *et al.* (2017) describe a self-reinforcing cycle of lending and land value. Land value is used as collateral for lending and the ready availability of credit increases the market value of land. In addition, there is a political dynamic where the apparent windfall gain of homeowners (as the value of their land rises) is desired by nonhomeowners. This leads to political pressure to assist in homeownership. The support schemes create further demand for land. As Turner (2017) points out, this has caused a major shift of bank activity from lending to businesses toward lending for land purchase. This close tie between land value and bank activity results in an important efficiency effect, namely, bank stability.

In the long run, a high rate of land rent tax would improve financial stability. It would reduce the *net* value of land to a very low value or zero. Individuals would thus have to purchase the value of a house, but instead of paying interest on the credit for the land purchase, they would pay land rent taxes to the government. This means that homeowners have an unchanged stream of payments to make, but the total amount of credit would reduce significantly. The debt spiral, which increases the instability of the financial sector (Keen, 2017), would thus be stopped. In the short run, however, banks could be destabilized from a sudden and strong reduction in their business. This will have to be considered in designing a land value tax.

5. Equity Effects of Land Rent Taxation

Rent taxation does not distort the supply of the tax base, but it affects equity, except in the hypothetical case of compensated taxation. As households own different shares of their wealth in the form of land, some households would gain as a result of increasing land taxes and others would lose. All changes in the tax system have advantages for some households and disadvantages for others. Distributional effects are thus no definitive reason not to increase land taxation. Instead, the tax should be designed in such a way that welfare increases—in particular, it should balance the interests of different groups of households and grant the desired level of priority to the disadvantaged. In the following, we discuss the effects that would have to be considered in tax design.

5.1 *Intergenerational Equity*

Feldstein (1977) describes a model of the intergenerational effect. There are two generations alive at a given point in time, young and old. The young generation works, the old generation owns land and lives off the land rent as well as capital income. The introduction of a land tax can redirect saving efforts away from purchasing land and toward purchasing capital, so that households invest more in capital. A land tax can thus correct an underaccumulation of capital and thus move the economy to a more efficient equilibrium.

Koethenbueger and Poutvaara (2009) point out that this analysis abstracts from the effects of the policy on the old generation at the time the policy is introduced: They lose a fraction of their retirement savings. However, there is a second effect involved. If the land rent tax is used to lower labor taxes, the young generation works more and thus increases the gross land rent. Under certain conditions, the effect of a higher land rent tax might even be compensated by the higher gross land rent, so that no additional burden would be placed on the currently old generation.

5.2 *Vertical Equity*

Feldstein (1977) and Koethenbueger and Poutvaara (2009) distinguish between the young and old generation, but all households are assumed identical within a generation. Stiglitz (2015), by contrast, highlights the role of heterogeneity in wealth and, more specifically, in land ownership. Investigating

increasing inequality, he conjectures “that much of the increase in inequality is associated with the growth in rents.” When land is distributed unequally in society, any policy that affects the value of land has distributional consequences.

Tax equity can be distinguished in terms of vertical equity (the progressivity of a tax) and horizontal equity. Horizontal equity ensures that “people in equal positions should be treated equally” (Musgrave, 1959). This distinction is illustrated in Figure 5. Rent taxation would raise no equity issue if the share of rents would be proportional to the total wealth, as demonstrated in the left panel. In this case, taxing a certain share of rents would reduce the wealth of all households equally. Equal rent shares would be an unlikely coincidence, however. The central panel illustrates the hypothetical case in which the middle class owns a high share of their wealth in land. In this case, they would bear the highest burden of the introduction of land taxes.

Concerning vertical equity, “data on land ownership is poor in most jurisdictions, making it difficult to assess whether a land value tax⁴ would be progressive” (Plummer, 2009). Bricker *et al.* (2017) provide some evidence that shows that land ownership in the United States increases in absolute amount in wealth, but decreases in relative terms. The main reason is that the largest asset of a household is typically the primary residence. The center panel of Figure 5 captures a pattern in a stylized way. The top 1% owns only around 9% of wealth in real estate (Geisler, 1995). According to this evidence, a linear land rent tax would be regressive. While land ownership might not grow proportionally with wealth, households with similar wealth may hold very different shares of their wealth in land. This is illustrated in the right panel of Figure 5.

In developing countries, vertical equity can have a particular importance. Almost all households in the poorest quintile in developing countries own land, because low-income households are typically subsistence farmers. As the term “subsistence farmer” suggests, these households have just enough to survive. Taxing the land of subsistence farmers would thus have extreme distributional consequences. However, the creation of tax free amounts of land could avoid these extreme effects (Kalkuhl *et al.*, 2018).

5.3 Horizontal Equity

A land tax would treat all households that have the same amount of land equally. However, when there are households that hold different shares of their wealth in land, the government would practically expropriate different shares of their wealth. For thinking about horizontal equity, it is the comparison of households with equal wealth that has relevance. Rosen (1978) specifies that horizontal equity is “defined in terms of some observable index of ability to pay such as income, expenditure, or wealth.”

Musgrave (1990) note that “for the more realistic case of limited policy options, vertical and horizontal equity goals may conflict so that a trade-off will be needed.” The right panel in Figure 5 illustrates this,

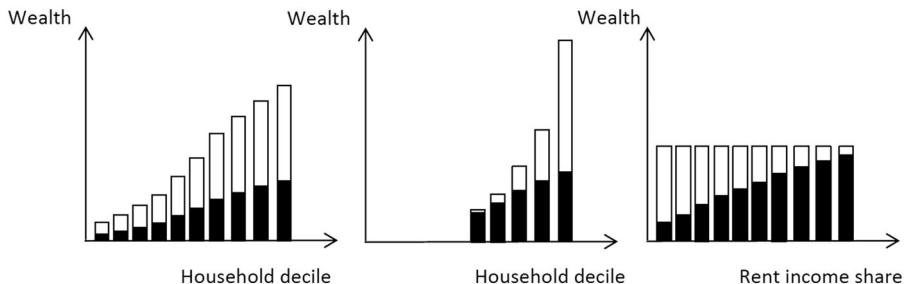


Figure 5. Conceptual Illustration of Different Scenarios of Wealth Distribution. Wealth Can Take the Form of Capital (White) and Land (Black). Scenario with Equal (Left Panel) and Unequal (Center Panel) Vertical Distribution, As Well As Unequal Horizontal (Right Panel) Distribution.

by “zooming into” one of the wealth deciles of the center panel. If a high rent tax would be beneficial in terms of vertical equity, the different households of equal wealth in the right panel would lose very different shares of their total wealth.

As is the case for vertical equity, there are no empirical results on the effect of rent taxation on horizontal tax equity. For property taxes (where both the land and improvements are taxed), Gary and Barrett (2005), Cornia and Slade (2006), and Sirmans *et al.* (2008) find that horizontal equity is a concern. Similarly, Plummer (2010) identify horizontal equity problems for a hypothetical policy of replacing a uniform property tax with a land value tax. These studies, however, are concerned with comparing the taxes to be paid with the market value of the taxed property. They do not compare the taxes to be paid by an individual with the wealth of the individual.

5.4 Revenue Recycling

When designing an optimal rent tax, the use of revenue needs to be considered. High-income countries are typically financed to a large extent by distortionary taxes, such as labor and capital taxes. In addition, land ownership is highly correlated with capital and labor income. The direct effect of a tax on land rents would be that landowners have an increased tax burden. This would affect mainly households at the upper end of the wealth distribution, but also those households owning their primary residence in the middle of the wealth distribution.

The net effect of a tax reform based on land rent taxation would depend on how the government uses the additional revenue. High-income countries have already satisfactory levels of government revenue, so that reducing other types of taxes suggests itself. These taxes are less efficient, so that the tax system could become more efficient overall. In addition, the tax reductions could be targeted at low-income households. This could be done by reducing income taxes for low incomes or reducing value added taxes, for example.

The overall effect of such a tax reform would be that high-income households have an increased tax burden and low-income households have a decreased tax burden. Such a redistribution would increase welfare. Given that the most valuable land, including commercially used properties and secondary residences, is concentrated among the very wealthy, even middle-income home owners stand to reduce their tax burden in such a tax reform.

In developing countries, a high share of low-income households own land. It might be unintuitive to tax land in such a situation. However, many developing countries have a high need to invest in infrastructure access for low-income households. Using revenues for infrastructure access could counteract the regressive direct effect of the land tax. For the example of carbon taxes, Jakob *et al.* (2016) calculate the potential revenue for different countries and how much of basic infrastructure needs can be covered with it. Given the enabling role of basic infrastructure, such a tax reform has the potential of reducing poverty.

5.5 Value Capture

Alterman (2012) and the contributions to Ingram and Hong (2012) distinguish rents by their origin. While “there seems to be a consensus among scholars that public investment costs should be at least partially covered by the financial benefits that these investments generate,” these authors also claim that “the value related to the original productivity of the land paid for by the owner and the increment in value generated by private land improvements should remain in private hands” (Ingram and Hong, 2012, p. 4). In the context of optimal taxation, it is not clear what would justify such a rule. Taxes on labor, capital, consumption, etc., all tax a value “paid for by the owner.” There is no reason to grant a special status to land.

Modern tax theory assumes that the government maximizes social welfare. Just like the other tax bases, land should be subjected to optimal taxation, where optimality is guided by a welfare function. The likely efficiency gains of taxation would have to be balanced with possible adverse distributional effects.

6. Conclusion

The proposed categorization of rent types can be used to derive a comprehensive set of policy implications. The political rents described by Stiglitz (2015) and rents based on market power should be addressed by competition policy—possibly including fines and taxes to deter anticompetitive behavior—or other types of government intervention. The latter of which could include running public utilities to avoid the formation of natural monopolies.

Taxation is a meaningful policy response for rents created by welfare-increasing types of regulation and for scarcity rents. Environmental regulation, however, often takes the form of pricing an externality, so that no untaxed rents remain. The empirical literature clearly shows that resource rents are derived from market power and not from resource scarcity. The most efficient response to resource rents is thus a combination of environmental and competition policy. Land rents are a classic example that would lend itself to rent taxation.

In 1991, Skinner asked “If Agricultural Land Taxation Is So Efficient, Why Is It So Rarely Used?” His conclusion was the administrative cost of land taxation (Skinner, 1991). Since then, mass valuation (McCluskey *et al.*, 2013; Almy, 2014) and comprehensive international support for land administration (Enemark *et al.*, 2014) have been developed, so that it may be time to reconsider using land rent taxation.

This paper highlights some of the areas needing further research to balance efficiency and equity effects of land rent taxation. One area is the possible distributional effect of land rent taxation on households in which land rents constitute a high share of income. An empirical analysis would require much more detailed data on the distribution of both land ownership and other sources of income. A second area is the interaction of the distributional effects of raising the tax with the distributional effects of using the revenue. It may be necessary to design taxation and revenue use jointly to avoid excessive distortions. A third area is the dynamical efficiency of land rent taxation when land rents capitalize investments, for example, in land-augmenting technological change. Land taxes will have to be designed in a way that does not discourage factor-specific innovations.

Notes

1. This definition of rent appears to coincide with the definition of the producer surplus. However, there is a debate on the precise definition of “producer surplus” as well (Mishan, 1968; Wessel, 1969; Pope and Chavas, 1985).
2. The benefit of publicly run providers as a means of avoiding excessive rent appropriation was pointed out already in Patten (1891).
3. Franks *et al.* (2017) assume the rents to be scarcity rents. According to the empirical evidence in Section 3.1, it is not clear to which resource this assumption could apply.
4. Notice that there is a difference between a land value tax and a land rent tax. Their economic effects, however, are identical (Oates and Schwab, 2009).

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